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ABSTRACT

As volume 2 of a 4-volume report, this document establishes certain design variables and objectives directed at arriving at a master plan for a recreation-education facility. The step-by-step design process is discussed in 3 stages which identify a general pattern of development for a recreation-education facility: (1) identification of significant regional or long-range information from which general patterns and priorities might be derived, (2) identification of specific site requirements for specific use or use in general, and (3) choice of a particular site and its development. The project goal is the establishment and operation of a recreation-education facility which is suitable for training people in desired skills and which provides a field laboratory for those in training and simultaneously meets local recreation needs. Related documents are RC 004 156, RC 004 158, and RC 004 159. (AN)

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VOLUME TWO:
A FOUR VOLUME REPORT

DELHI RECREATION - EDUCATION PROJECT REPORT

PROTOTYPE DEVELOPMENT

SCHOOL OF LANDSCAPE ARCHITECTURE

STATE UNIVERSITY COLLEGE OF FORESTRY
AT SYRACUSE UNIVERSITY

RC 004157

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SCHOOL OF LANDSCAPE ARCHITECTURE - BRADFORD G. SEARS, DIRECTOR SYRACUSE N.Y. AUGUST 1969

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INTRODUCTION

This section deals with the process of arriving at a master plan. The process involves a multitude of relationships all of which cannot be identified much less described in detail. The attempt is made, however, to explain the process for the purposes of understanding the kinds of information and activities necessary for the development of a master plan. It is hoped that as a result, the reader will get an insight into the design process, and understand the kinds of information the designer uses and the role of this data in the process.

Any discussion of a process must proceed in a step-by-step manner, but it must be realized that no step is independent nor does it occur in as strict and logical order as might be indicated. Each step is many faceted and has ramifications upon those which precede and those which follow. The process is discussed here in three stages that identify a general pattern of development and categories or ranges of investigation and development in the master plan of any such facility.

The three stages are as follows:

i. identification of significant regional or long range information from which general patterns and priorities might be derived.

ii. identification of specific site requirements for specific use or use in general.

iii. choice of a particular site and its development.

The first thing to consider in any project is the goals or aims of the assignment. The goal in this case is the establishment and operation of a recreation-education facility. More specifically, the recreation area should provide two things:

i. an education facility or facilities suitable to train people in those skills that are desirable.

ii. a recreation facility that provides a field laboratory for those in training and which meets local recreation needs simultaneously.

THE REGION

INTRODUCTION

As outlined earlier, the first step involves regional and long range considerations. For the purposes of this report, the region identified is the Appalachia Region of New York State. This is identified primarily as an area of general economic need and there is considerable up-to-date and thorough information available about it.

It is perhaps useful to consider recreation as a marketable facility, as a product for sale, which must then exist in the competitive world. This is helpful whether the ultimate facility is profit motivated or user motivated. In one case, the product is the end and in the other the product is the means. In either case the net result, if the goal is to be achieved, is a recreation facility which is at least marketable if not actually competitive. The approach would thus be a market approach.

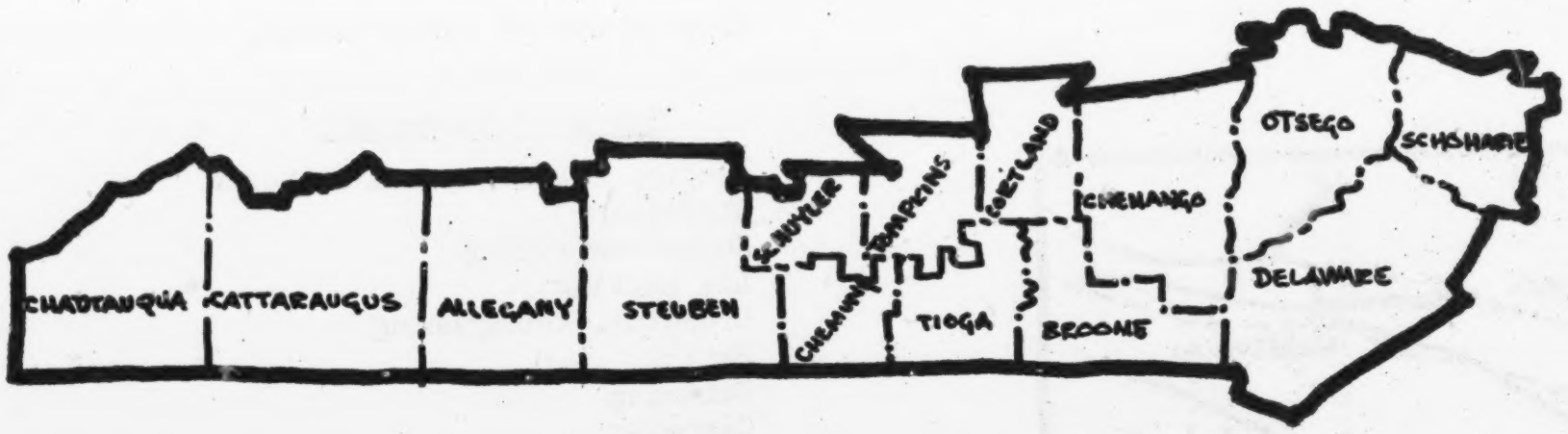
Marketability involves essentially three things:

i. The client preference

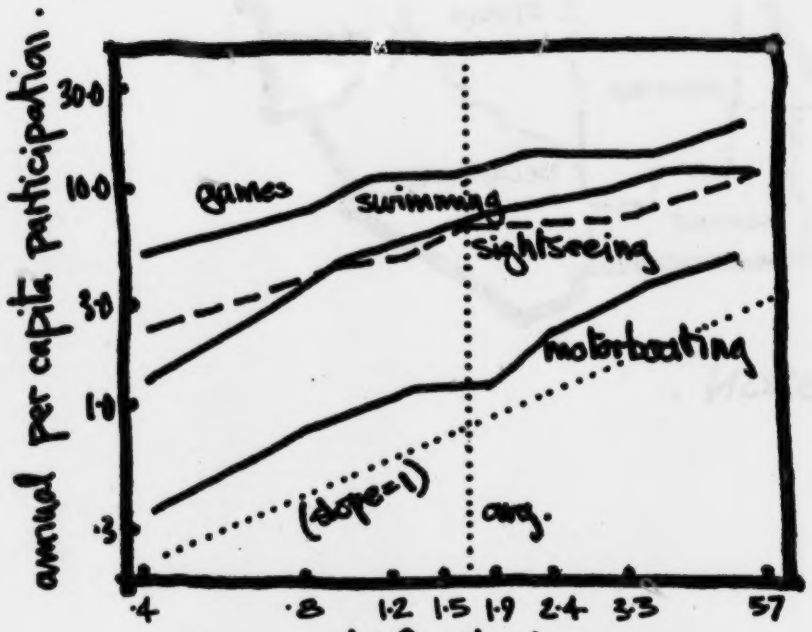
ii. Making the product available

iii. The product itself

If these three variables are converted into recreation potentials, we should then be able to measure the variable success of any proposed recreation program.



NEW YORK STATE APPALACHIAN REGION.



RELATIONSHIP BETWEEN INCOME AND PARTICIPATION IN SELECTED ACTIVITIES FOR WHICH PARTICIPATION INCREASES WITH INCOME FOR BOTH LOWER AND HIGHER THAN AVERAGE INCOMES.

ORRRC #19, p. 67.

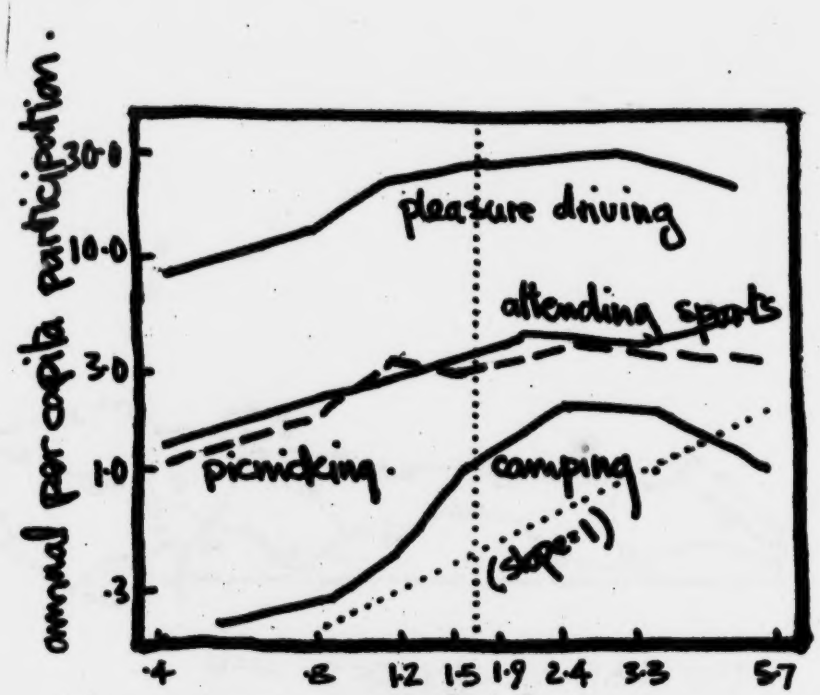
CLIENT PREFERENCES

The first item is client preferences. Outdoor Recreation Resources Review Commission[3] has done a very thorough study on the participation rates of various activities. The following is a simplification of one of their tables.

Types of Recreation	Annual days per person
Playing outdoor games & sports	12.71
Bicycling	5.71
Horseback riding	1.25
Ice skating	.55
Sledding, Tobagganing	.51
Skiing	.07
Swimming	6.07
Canoeing	.12
Sailing	.11
Other boating	1.95
Water skiing	.41
Fishing	4.19
Camp	.86
Hiking	.42
Mountain climbing	.09
Hunting	1.86
Picnicking	3.53
Walking for pleasure	17.93
Nature Walks	2.07
Driving for pleasure	20.73
Sight seeing	5.91
Outdoor sport event	3.75
Outdoor concerts drama	.57

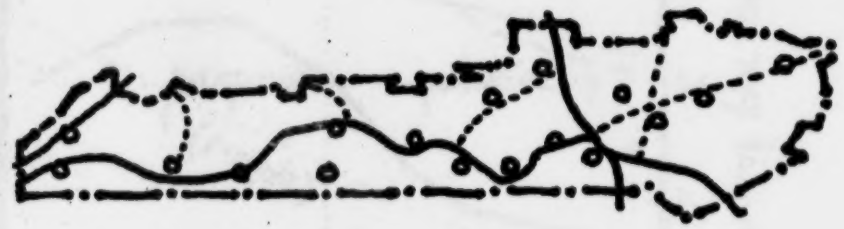
The table gives the total annual days participation per person 12 years of age and over and gives an index to relative popularity of the activities. From the table one might assume that certain activities would be provided first, others second, third and so on. However, a more careful analysis of this table and what it means might suggest a slightly different approach.

A closer analysis of local conditions will reveal variance within the rates of participation. The accompanying three charts show the affect that income has on the participation rates in a variety of activities. A number of other variables, such as education, social class and ethnic background, create other variances in the general participation patterns. At least a general understanding of participant preferences is necessary in order to consider which activities may or may not be necessary and appropriate.



RELATIONSHIP BETWEEN INCOME AND PARTICIPATION IN SELECTED ACTIVITIES FOR WHICH PARTICIPATION INCREASES WITH INCOME FOR LOWER THAN AVERAGE INCOMES BUT LEVELS OFF OR DIPS FOR HIGHER THAN AVERAGE INCOMES.

ORRRC #19, p.68.



POPULATION CENTERS AND TRANSPORTATION CORRIDORS.

- o population center
- ~ existing transportation corridor
- ..... proposed transportation corridor

ACCESS

In addition to demand, other things must be considered including transportation and population concentrations. The accompanying diagram shows transportation corridors, proposed and existing in the region, which indicates where the people are and the ease with which they can reach any point in the region. A recreational facility is in better economic location if it is in easy access of major population centers.

> Access is measured by a variety of factors. The time spent in travel, the physical availability of desired types of facilities, the economic availability of the resources based on a schedule of fees or costs relative to the satisfaction received, and other features affect access to recreation opportunities.(2, p.11)

Subareas are delineated on the basis of access.

> The first subarea, whether user-oriented or local must be easily accessible to be successful. Large urban populations and short periods of leisure are the two important factors for these types of facilities. Intermediate or all-day recreation facilities are those that can be reached fairly easily and that are no more than a couple of hours driving time from home for most users. The last group-the resource-based areas-are situated without reference to population centers. People must go to them. Facilities are a secondary consideration in the drawing power of these resources.(2, p. 12)

GENERAL CLASSIFICATION OF OUTDOOR RECREATIONAL USES AND RESOURCES

With respect to -	Characteristics of -		
	Consumer-Based	Intermediate	Resource-Based
General location	Close to users; on whatever resources are available.	Intermediate; must not be too remote from users; on best resources available within distance limitations.	Where outstanding resources can be found; may be distant from most users.
Major types of activity	Games, such as golf and tennis; swimming; picnicking; walks & horseback riding; zoos, etc.; playing by children.	Camping, picnicking, hiking, swimming, hunting, fishing, boating.	Major sightseeing; scientific and historical interest; hiking and mountain climbing; camping; fishing and hunting; boating; winter sports.
When major use occurs	After hours (school or work).	Weekends and holidays.	Vacations.
Typical sizes of areas	One to a hundred, or at most to a few hundred, acres.	Usually some few hundred to several thousand acres.	Usually some thousands of acres, perhaps many thousands.
Common types of agency responsibility ...	City, county, or other local government; private.	State parks; private.	National parks & national forest primarily; State parks in some cases; private, especially for seashore & major lakes.

Source: Resources for the Future, Annual Report for the Year Ending Sept. 30, 1957. Washington, 1957.

There are many ways of measuring economic potential. The Appalachia Report (6) uses a method which is satisfactory for demonstration purposes. Three variables were used: lodging and recreation expenditures in the area, a multiplier established by Nathan in his report,(1) and internal and external population potentials. The result is a measure of the economic and population potential of the region. The economic multiplier indicates the additional employment or population which can be expected in service supporting or "non-basic" industries in an area by the addition of one "basic" employee. Given a multiplier of 1.86 for example the addition of 100 employees in a basic or exporting industry could be expected to generate an additional 86 persons in non-basic employment to support and service the first 100.

The importance of this discussion is to establish the demand and the economic potential, and then to relate this to the question of whether the natural resource base can meet or be made to meet the demand.

COMBINED POPULATION AND ECONOMIC POTENTIALS

- very high
- high
- medium
- low

from Appalachian Recreation and Cultural Resources Study.

PRODUCT CHARACTERISTICS

The last and final large scale considerations involve the product itself, in this case the marketability of skills and the availability of recreational facilities. Availability has three parts; the natural resource, ease of development, and competition. Again quite simply the parts are one and distinction between them is slight.

The natural resource is a significant part of outdoor recreation and cannot easily be separated from it. Recreation depends upon physical conditions as well as visual characteristics of land, soil, vegetation, climate, and many other factors. Such things as land form, soils, percent slope, water features, natural vegetation characteristics, topography, extent of forest cover separate and combined are indicators of general land character. They give a measure of visual and functional suitability for recreational development. The Appalachia Study uses basically three variables to determine landscape character which is primarily a measure of visual quality. As a result of the combined influence of topography, water features, and forest cover a determination of those areas with high or low landscape character was derived.

Slope

■ over 10%

Soils.

■ alluvial & limy soils in valley bottoms

▥ shallow acid soils on glacial till over steep terrain

□ deep acid soils on glacial till over hill terrain

adapted from Thompson's Geography of New York State

Jay S. Shivers(5) comments that consideration should be given to those terrain features such as, "land elevation, flatness, ruggedness, hills, mountains, gorges, valleys, canyons, sloping land, coastlines, contours, and other prominences" that "help or hinder certain aspects of a recreational program." It might be added that other natural factors such as vegetation and forest cover, as well as social and political factors combined to make certain areas more suitable than others. He also points out that when certain geological features abound certain activities follow such as spelunking, mountain climbing; and collecting and conservation activities. Activities may sometimes only be accommodated by man made improvements to the site.

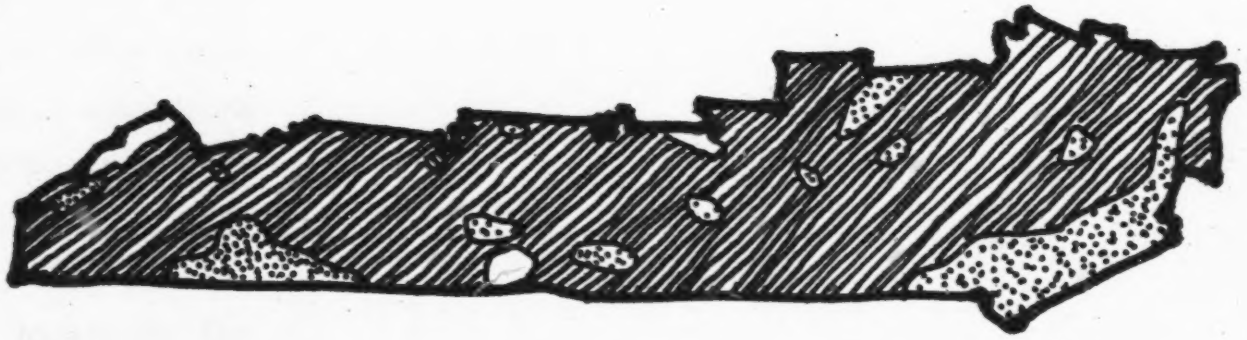
Climate has direct influence upon any recreational program. Seasonal changes, mean temperature, rain cycle, snowfall, wind and sun patterns affect the type and kind of activities that occur. In some parts of the country outdoor recreation can occur eleven months out of a year, in others it can occur in less than four. Climatic extremes influence the type and form of facilities that are provided. It may make the difference in whether an activity can occur outside or inside a building.

Climate.

- cold snowy winters
  cool wet summers
- cold snowy winters
  warm dry summers.

Forest Cover.

- alternating forest and farm land or urban. Farm land and forest roughly equal.
- forest land - farms scattered or absent. less than 1/3 farmland; wood lots over 50 acres, forest tracts over 1000 acres
- farmland - wood lots scattered. less than 1/3 wood lots and forest tracts: wood lots less than 20 acres, forest tracts less than 250 acres.



adopted from Thompson's
Geography of New York State

Along with natural resource are the other resources such as manpower, financial availabilities, and historical resources. All have a bearing on the range of suitable activities.

Perhaps a paralled group of considerations would be the ease of development which is dependent upon the resource base, the political and social structure and the activities themselves. The source base will usually require some man-made improvements. It is clear, however, that the fewer improvements the easier the improvements will be accomplished. The social and political structure that deals with implementation will also have an affect upon ease of accomplishment. The activity itself, as it relates to the resource base, will give an indication of the ease of accommodation. The physical provision of a trail through the woods is simpler than to construct an even modest skiing facility.

A difficult item to measure but a nonetheless significant one is competition. Competition comes from both the private and public sectors, from existing facilities and future facilities. It is affected by all of the other factors, natural resources, availability of services, transportation, consumer demands, population

concentrations and the rest. Competition is the net result of market ability. The most accurate analysis involves a careful survey of the existing and proposed facilities and their impact both recreationally and economically.

USE REQUIREMENTS

INTRODUCTION

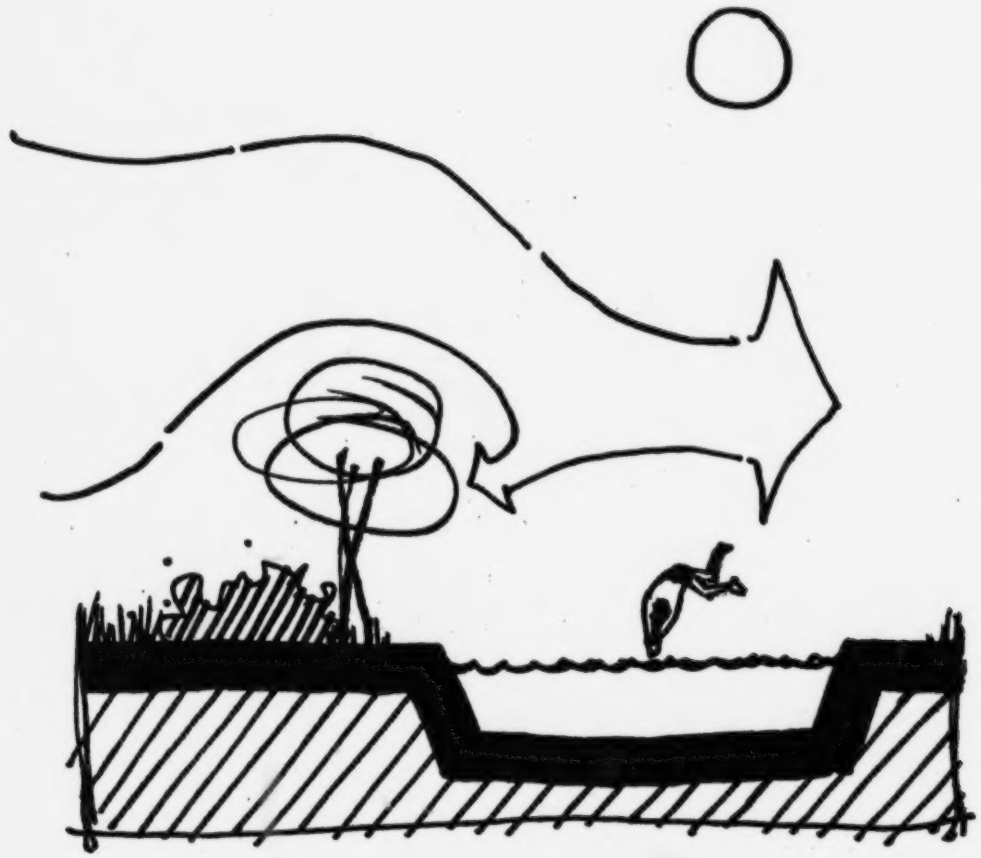
The second stage of involvement is with use requirements both specific and general. If use is being programmed, there are general site requirements and specific use requirements which must or may be met.

Factors to be considered fall into two basic but interdependent categories, the first contingent upon site, the second upon use, and both reflecting visual and functional aspects of land use.

These factors can also be divided into social or man-made, and natural. Restrictions in regard to land use include existing land use, property lines, right-of-ways, zoning, health and building codes, transportation routes, utilities, and other physical limitations. These influence where and how development can occur, and often provide powerful physical lines of demarcation. Their equally powerful although perhaps less obvious control over visual design should also be recognized. The visual strength of a road, a property line, or right-of-way should not be overlooked. Nor should the existing land use and zoning controls be disregarded as a significantly compelling force in visual design.

Equally important are those natural features that play upon functional and visual design. The natural elements of wind, soil, sun, temperature, vegetation, and natural drainage have (or should have) great impetus in giving direction and form to development. Often too little acknowledgement is given to natural features in land use designation. The visual aspects of natural features may be appreciated but little understood. A good visual natural environment is generally accepted as a stroke of nature. Outdoor recreation development, however, provides the opportunity for a sensitive interpretation of nature due to its closeness to the natural environment.

Besides having general limitations and requirements for development that must exist regardless of type of development, each use has its own specific requirements both visually and functionally. Each must be visually satisfying but with some activities the visual aspect is the major item while in others it may be a secondary or coincidental element. A golf course or a ski slope does not in itself require a visually exciting environment, although each provide excellent opportunities for sensitive development with nature.



trees, shrubs, and topography afford protection from cooling summer breezes while sun warms water...
allows for a longer swim season.

Any development has minimum standards that must be met in order that it function properly. In addition to those minimum standards each use has desirable or optimum conditioner that make the difference between a mediocre and exceptional development. Any discussion of use requirements would therefore include both the necessary and the desirable. The Bureau of Outdoor Recreation's publication, Outdoor Recreation Space Standards[2] is the source of the standards that follow.

Outdoor recreation embraces a large number of varied activities. The following list includes those activities and facilities proposed at the Valley Campus Development and other activities that would normally be associated with outdoor recreation.

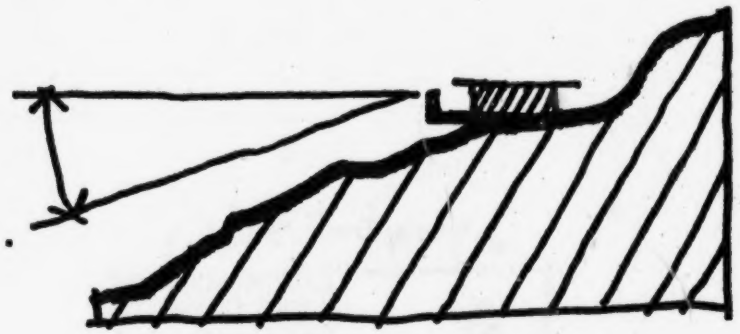
CONFERENCE CENTER

The conference center requirements depend to a large degree upon the intended use or uses to which it may be put, its role in the overall development and the intended relationship with the other parts of the development.

Conference Center Considerations:

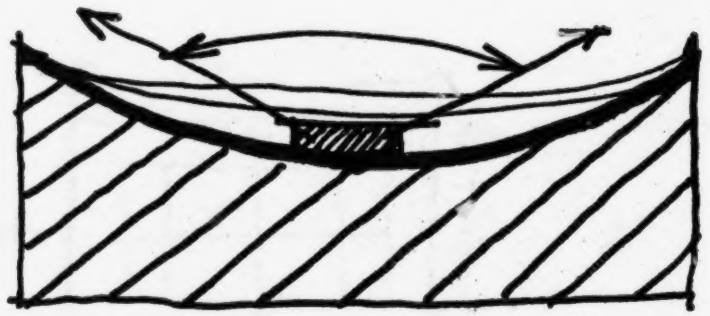
1. Use or uses: hotel, restaurant, classes, conferences, museum, display, educational and recreational.
2. Role: major focus or secondary element.
3. Relationship: coordination with skiing, golfing, hiking, beach or lake, school or farm facilities, pro shop, changing rooms, warming room, snack bar, bar, etc.
4. Access: services, utilities, parking and transportation.
5. Siting: to be viewed, views from, construction, physical relation to other parts.
6. Aesthetics: architectural suitability and integration with landscape.
7. Specific standards would depend primarily on use considerations and sitings.

Other items might properly be considered include closeness of water, good natural setting, and proximity to city and college complex. Secondary facilities that might be included in a conference center development are a swimming pool and tennis courts.



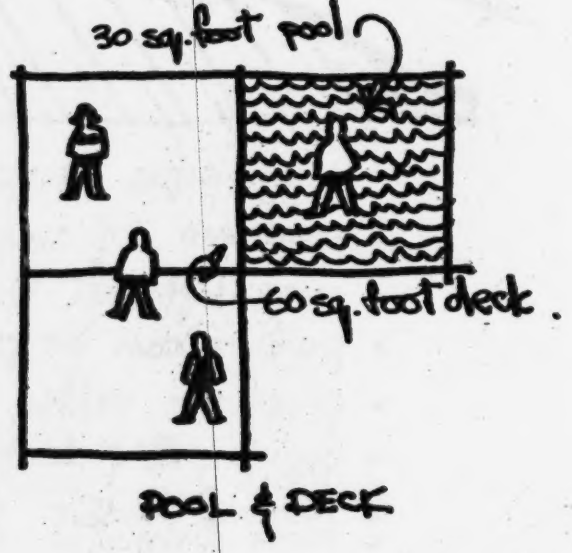
HILLSIDE SITE

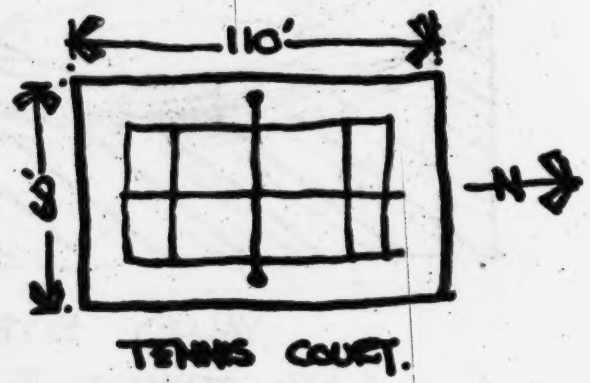
- panorama of area
- more difficult to build
- parking can be problem
- preserves valley floor
- views out & down, access valley
- more dramatic setting



VALLEY SITE

- less expensive to build
- building area plentiful
- views up & out, thru valley.
- parking area is problem
- not as dramatic setting.





Pool Considerations:

1. Standards:
   30 square feet per person in water
   $\frac{1}{4}$ of people in the water at any time
   2/1 ratio deck water
2. Water, pump and filter facilities.
3. Diving area: size, number of boards and control.
4. Changing and life guard facilities.
5. Semi-protected but sunny, allows for longer swim season.
6. Construction: pool and deck material, fencing.

Tennis Court Considerations:

1. Paving material - clay most popular, concrete or bituminous material has lower maintenance costs and is more suitable where multiple use such as skating in the winter is intended.
2. 60 x 110 ft. minimum area recommended per court.
3. Uniform grade, free from irregularities.
4. The long axis of the courts should run north and south.

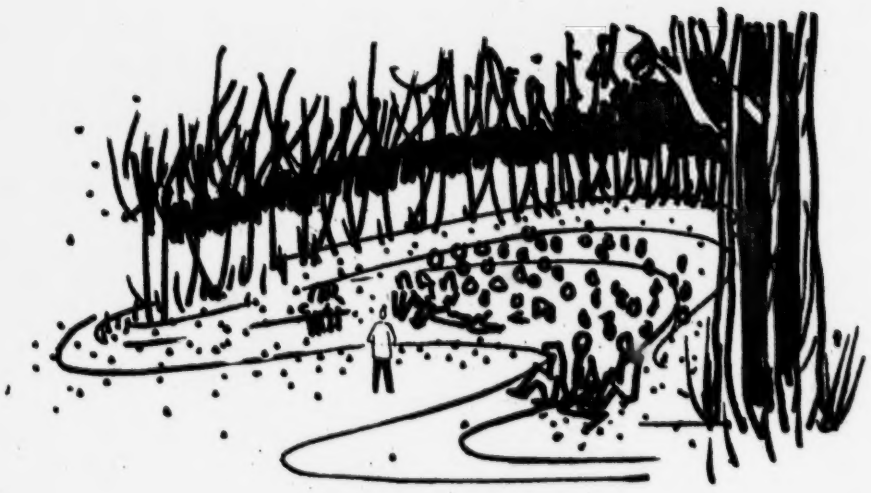
AMPHITHEATER

The amphitheater is a particularly flexible facility with few actual requirements. The facility could range from a few logs around a fire to a large sloping grassy "bowl" or an elaborate concrete or masonry structure.

Amphitheater Considerations:

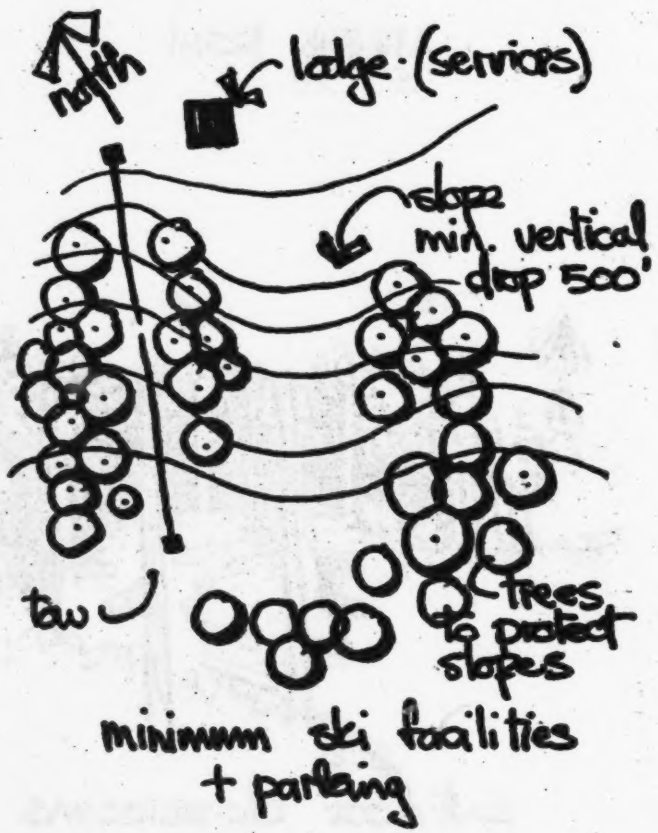
1. Amenities: cool breezes in summer protection from cooler fall and spring breezes.
2. Services: toilets, access, parking, concession, ticket sales (when appropriate or necessary).
3. Adequate drainage and air circulation to aid in drying out, especially if sitting is provided on the ground.
4. Protection from erosion depends upon intensity of use.
5. Space requirement: five acres suggested as ideal size.

The outdoor classroom is a facility that is easily integrated into the natural landscape. It is usually a matter of augmenting a physical environment rather than creating a new one.



grassy bowl

outdoor classrooms



WINTER SPORTS

Winter sports activities have a wide range of requirements. All with the exception of skating require snow in lesser and greater quantities and all, especially skating require extended periods of freezing weather. Perhaps the most sophisticated in terms of facilities is skiing and least sophisticated might be tobagganing, sledding, and snowball throwing. Snowmobile and skating facilities, in between these extremes, have only minimal requirements.

Ski Facility Considerations(1):

1. Standards

Quality Skier	% Slope	Vertical drop X Number of runs
novice	0-20	5,600 feet
intermediate	20-35	8,000 feet
expert	35-up	12,000 feet

one acre per 30 skiers
slope width 100-250 feet
one acre parking per 10 acres slope
60 inches of snow per year minimum
80 to 85 skiing days per season
minimum vertical drop 500 feet

2. Orientation of slopes toward the northeast for protection
3. Trees along edge of slope for protection and snow accumulation
4. Tows: "j"-bar, "t"-bar, rope tow, chair, snow-making machine; lodge, restaurant, ticket sales, ski shop, warming hut, and ski school depend upon sophistication of facility which in turn is dependent upon capabilities of site and the market demand.

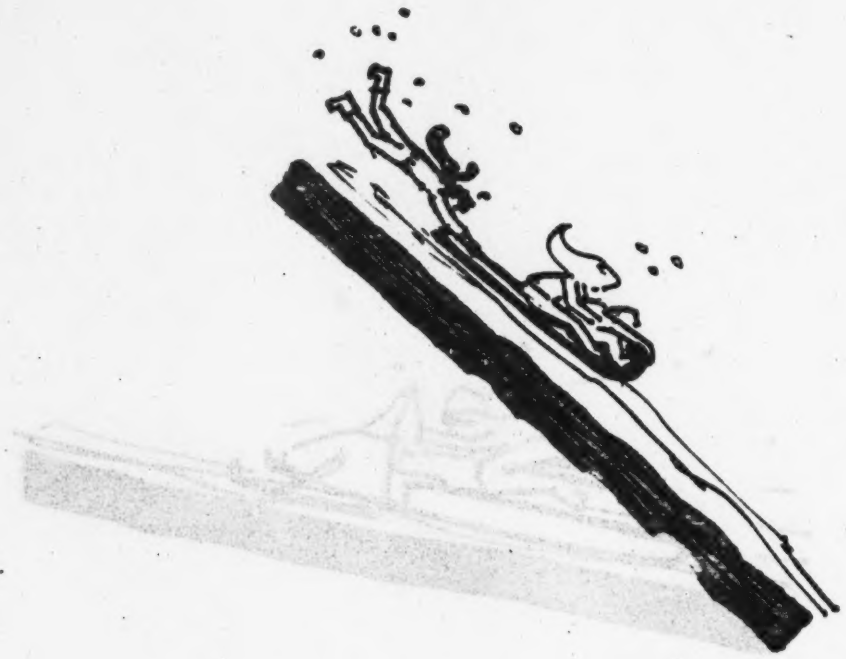
5. Consider off season use for hiking, nature area, etc.
6. Control drainage. Water on slopes is very damaging to snow condition.
7. Visual integration with the landscape is desirable.

Snowmobile Considerations:

1. Trails: roads, minimum width to accommodate two vehicles, eight feet, paving desirable.
2. Fields: agricultural or other, snowmobiles generally not harmful.
3. Separation from ski facility for safety.
4. Careful consideration should be given to determine the appropriateness of snowmobiles and the control of their designated spaces.

Skating Considerations:

1. Ice protected from winds that may damage ice surface.
2. Water: natural pond, lake, artificial impoundment, pool, flooded tennis courts or athletic fields (allows for seasonal use of normally seasonal facilities).
3. Water for reflooding for ice surface improvement.
4. Warming or changing facility may be incorporated in conference center of ski lodge.
5. Provision of areas for figure skating or hockey.
6. Benches for resting and skate tightening on side of rink.



Tobogganning and Sledding Considerations:

1. Snow, no real minimum.
2. Slope open and 10 to 25%, long, moderately steep.
3. Parking and access.
4. Possible coordination with conference center, provision of a suitable area may preclude less desirable use of golf course for such activity.

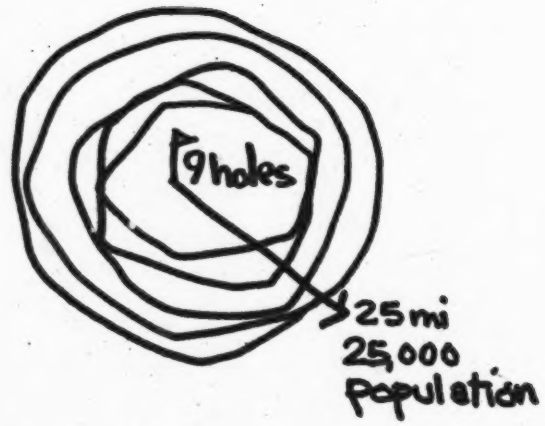
GOLF

No specific standards exist in relation to distance from tee to hole, pattern of course, etc. Each course has its own personality based upon the site and designer's potential.

Golf considerations:

1. Standards: 9-holes (double for 18 holes)
   60 acres total
   a. fairways, roughs, greens - 43 acres
   b. club house - 0.25 acres
   c. parking and service roads - 1.75 acres
   d. natural areas - 20 acres
   e. landscape area - 10 acres
   Clearly half is for beautification and integration with natural landscape.
   Par three course - 25 acres.
2. A 9-hole course can serve a population of 25,000 within a twenty-five mile radius and accommodate 350 persons per day and 18-hole course will serve twice the population and accommodate 500-550 persons a day.
3. A natural site, partially wooded, varying topography, water for variety and challenge.
4. Greens above flood level.
5. Source of water for irrigation.
6. Service facilities - parking, club house, pro shop, showers and changing facilities.

The golf course provides the greatest opportunity for integrating an active use area with the natural landscape by use of natural land features and vegetation and control of spaces appropriate to a golf course.



Turf Management

Turf management can be easily incorporated into the golf course facility with the turf being within the golf course proper or separate. Cooperative use of service facilities such as watering and mowing equipment might also be easily accomplished.

AGRICULTURAL

The agricultural facilities are functional facilities and as such the visual or aesthetic aspects of the facility are secondary.

Agricultural Considerations:

1. Size and facilities depend upon scale of activity.
2. Functional aspect contingent upon quality and amount of agricultural land available and the services necessary for the facility.
3. There is a potential for undesirable smells and sites: also potential for interest area with its bucolic atmosphere.
4. Should not neglect the desirability of such a facility in an agricultural curriculum.
5. Stables coordinate with grazing area, trails, and riding ring.

Heavy Equipment Training Area

A rough area requirement of ten acres, this use requires careful consideration as to location. It is a large generator of noise and dust. Should be down wind and separated as much as possible from other facilities, or isolated completely.

WATER BASED ACTIVITIES

The major criterion for this facility is a suitable water body or the potential for developing one. Water based recreation activities are the best drawing card in most recreation areas. Generally a source of flowing or impounded water is a visual as well as functional attribute to any area. Boating, swimming, fishing or any other water uses need two basic elements: water suitable for the activity and access to that water.

Boating Considerations:

1. Standards:
   Five acres per 2000 population
   Each five acres can accommodate:
   20-35 boats, anchored, fishing
   or 10-20 boats, trolling
   or 1-2 boats, sailing or power
   or one boat water skiing
   One boat launch for 150 acres water - it should be 12 feet wide and can accommodate 40 boats per day.
2. Should consider boat and canoe rentals.
3. Small lakes control motor size.

Swimming Considerations:

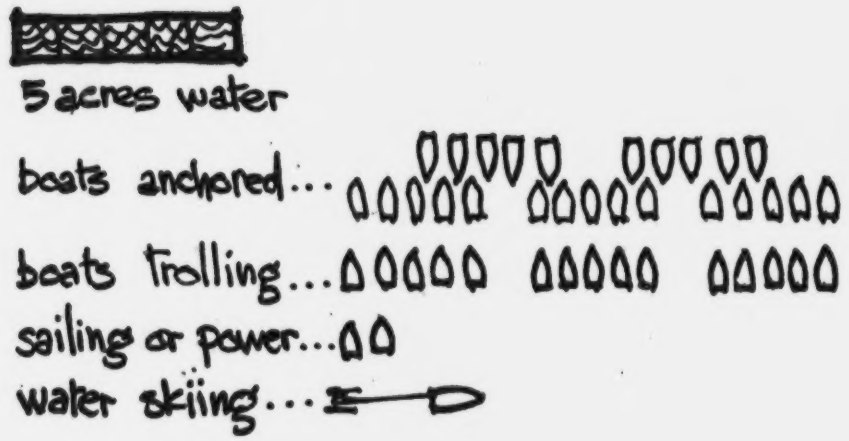
1. 25 foot width of beach for 150 persons per day.
2. Expanse of clean, sandy beach desirable. Consider paving or other alternatives in intensely used areas.
3. Smooth contoured swimming area necessary.

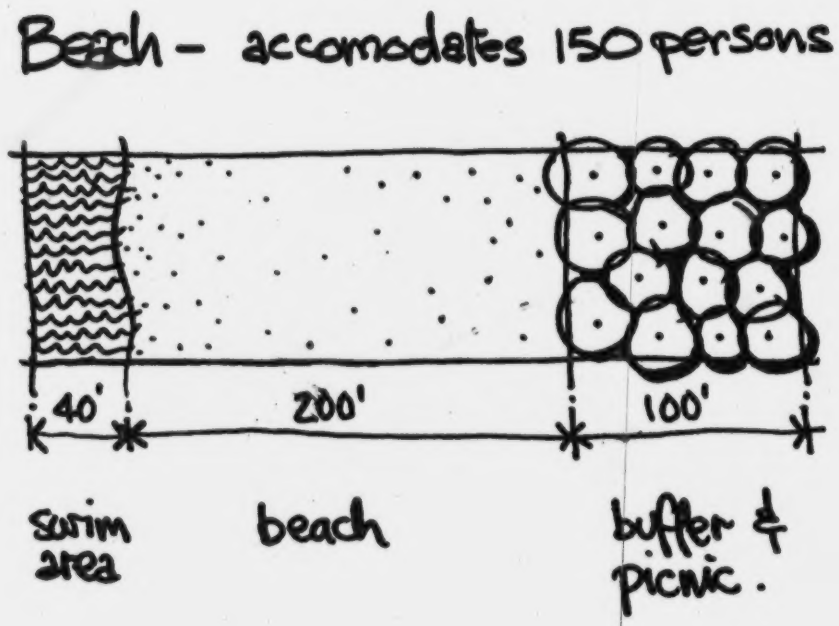
4. Non-polluted water sources, chemically and biologically suited for bathing; circulation of water through swimming area desirable.
5. Readily accessible - adaptable for recreation, dressing, and parking facilities.
6. Popularity and general usage, good criterion for development.

Fishing

Fishing requires parking, access to lake or stream, and boat launch and/or rental occasionally. Consideration should be given to the possibility of stocking.

The water based activities depend primarily upon the water; its general availability and access either existing or potential.





MAPLE SUGAR PRODUCTION

Major consideration is the presence of hard maple trees in sufficient number. Other considerations:

1. Brief seasonal use.
2. Operating in conjunction with conference center.
3. Unobtrusive, non-destructive, easily facilitated activity.
4. Roughly 25 feet of tubing per tree slope.

CAMPING AND PICNICKING

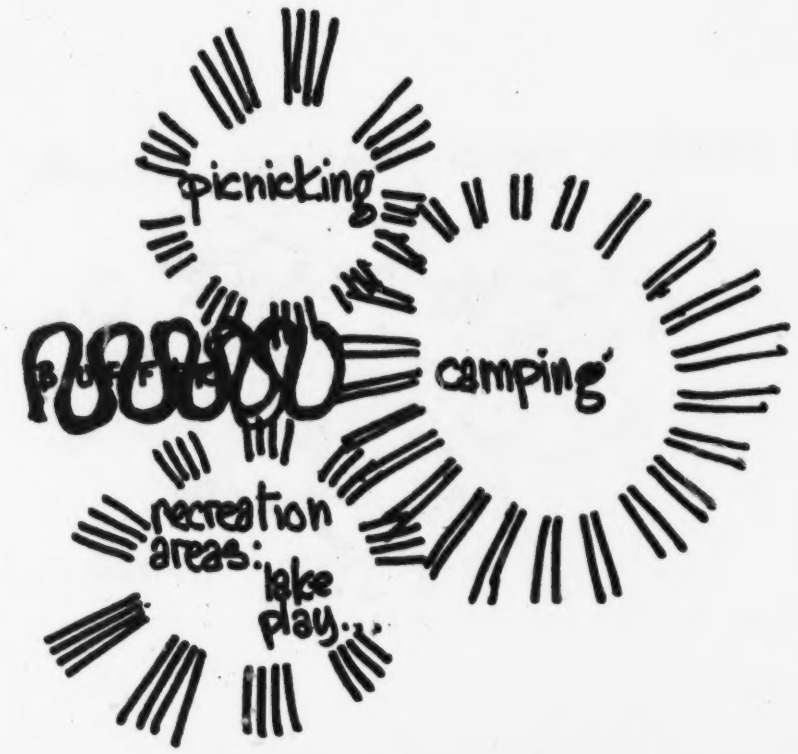
Camping and picnicking are very similar to each other in general requirements. The major variation is in area needs. The need for level ground, services and multiple of activities is similar for each.

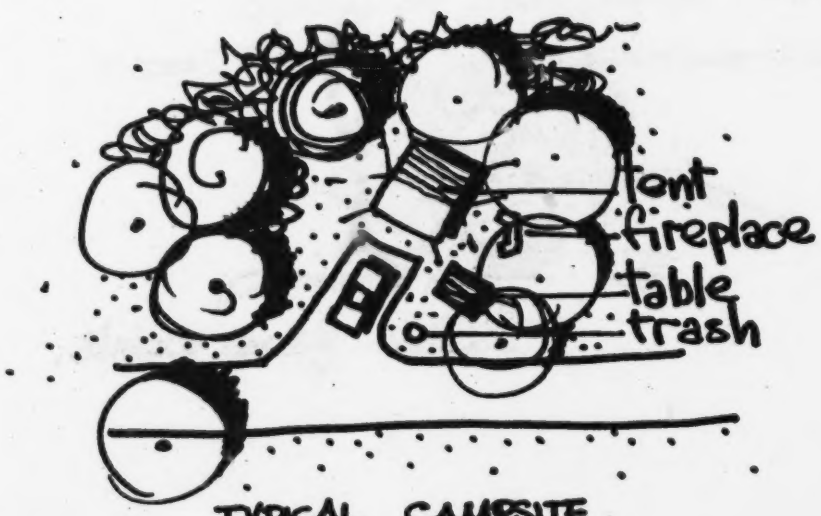
Camping Considerations:

1. Standards:
   Total camp is 50 x 50 feet with a minimum 75 feet separation.
   Allow about three sites per acre.
   Each camp: fireplace, eating and cooking area, tent area, trash receptacle, car space, and be within easy walking distance of toilet and water facilities.
2. Tent and trailer area need about 0-8% slope, tent camping can be accommodated on a steeper site where people can walk to site and space requirements are limited.
3. Generally desirable to open up camp sites in the woods to allow sun and breezes to dry tents in the day.
4. Desirability of multiple activity provisions, increase in kinds of activities available improves the general popularity of the camp area. Most important are boat services, launching and rental and swimming facilities.

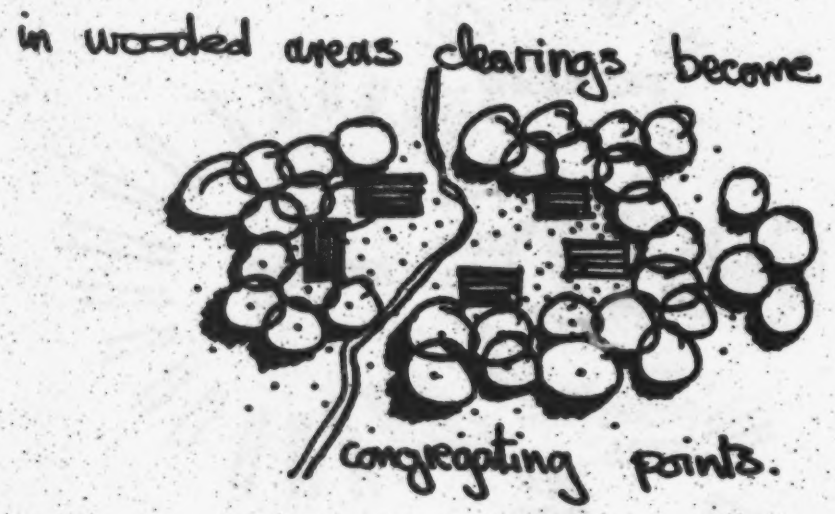
Picnicking Considerations:

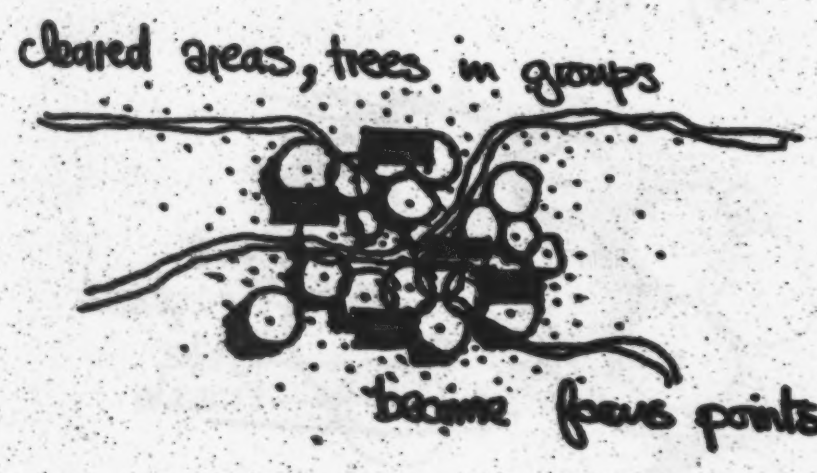
1. Standards:
   8-10 tables per acre for family picnicking.
   16 tables per acre for organized group picnicking.
   10 people per table per day.
   Groups of five with turnover rate of two per day.





TYPICAL CAMPSITE.





One parking space per table plus a few.
One grill minimum for 4-5 tables.

2. 3-4% slope desirable for maintenance and erosion control.
3. Desirability of close link to water based or other activity.
4. Should be physically separated from camping area.

Both camping and picnicking are highly seasonal activities occurring about 50-60% or more in the three summer months and do not allow for much alternate activities in the off months.

WILDLIFE AND NATURE AREAS

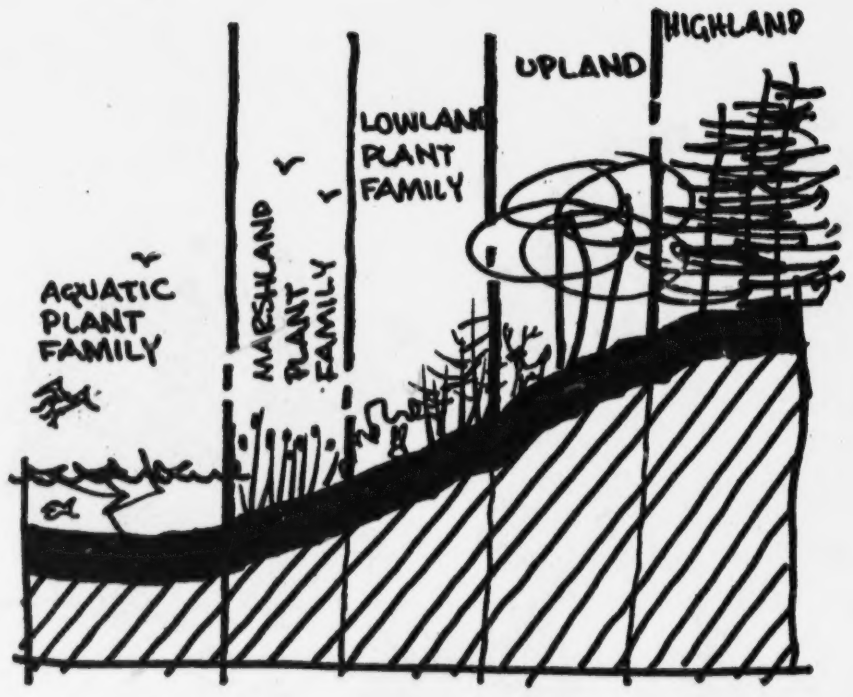
Nature area range from wild or wilderness areas to planted or recovered agricultural lands. Major considerations involve the natural base, its availabilities and potentialities and purpose for which the area or areas might be put. Nature or wildlife areas have no standard area requirements. The area could be a corner of, or be the whole of a major scenic area.

Nature Area Considerations:

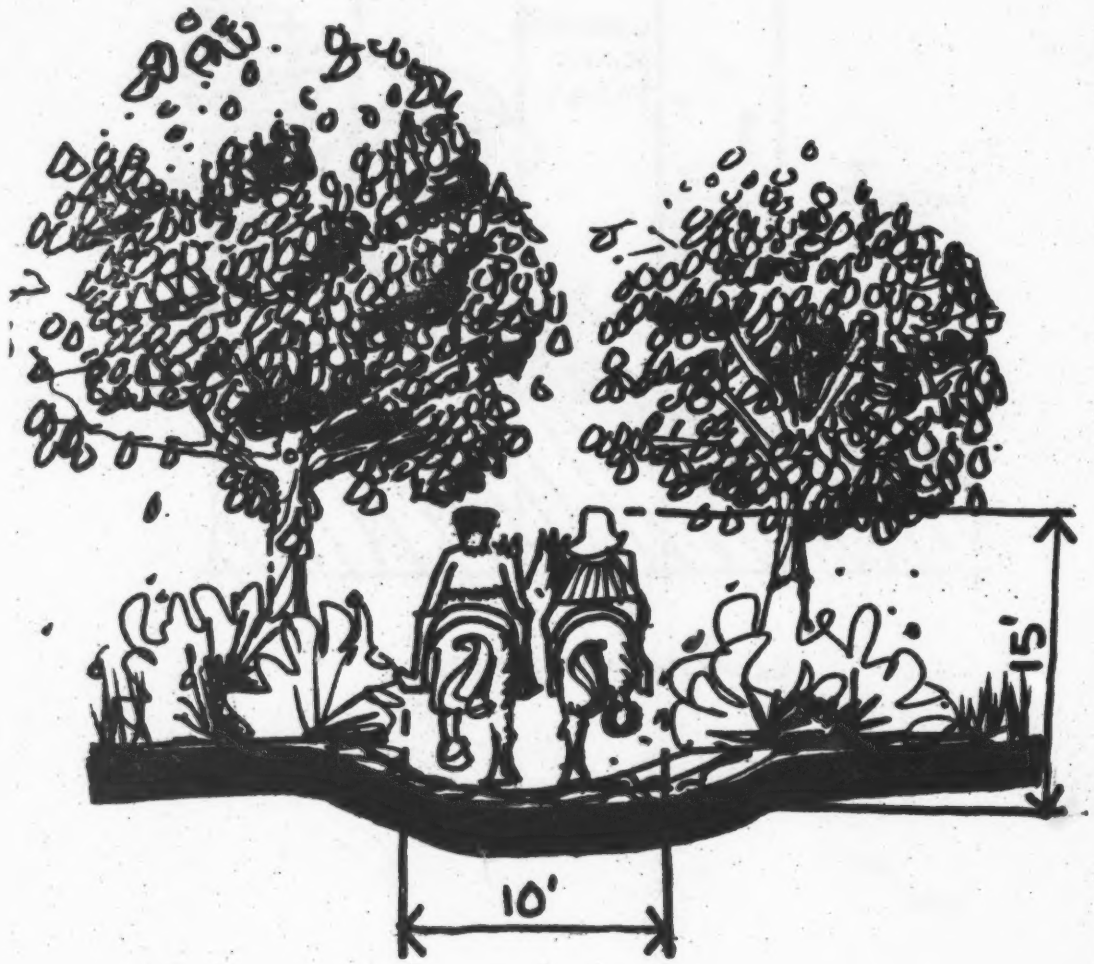
1. Wildlife stocking, planting, etc. may be done to improve potential of area.
2. Several educational uses possible: resource management demonstration, fire preventing, barnyard display, farm pond, wildlife food plantings, garden plots, day camp sites, tree and shrub nurseries, sugar bush to name a few.
3. Suggest selection of theme or themes, contingent upon historical, environmental types, resource uses, or other natural based considerations.
4. Especially appropriate in Appalachia region is abandoned agricultural land reclamation.

Hiking Trail Considerations:

1. 5% average slope. 15% maximum.
2. Three mile trail and 1½ mile trail.
3. Scenic:
   variety, overall unity, water, woods, fields, scenic vistas.



ECOLOGICAL ZONES



4. Consider theme and object of trail (recreational, educational or both).

Bicycle Trail:

1. Wide enough for two riders
2. Five miles long at least.
3. Hard surface which avoids tire damage.
4. Avoid motor crossings.
5. Scenic and historic interest.
6. Far from traffic noise or fumes.
7. Nearly level, shade trees, services.
8. Bicycle rental station.

Equestrian Trails:

1. Path 10 feet wide cleared to 15 feet.
2. Avoid traffic.
3. Suggest not used in conjunction with hiking trails.

Other potential trails are: boats, sight impaired non-ambulatory, tiny tots.

MASTER PLAN DEVELOPMENT

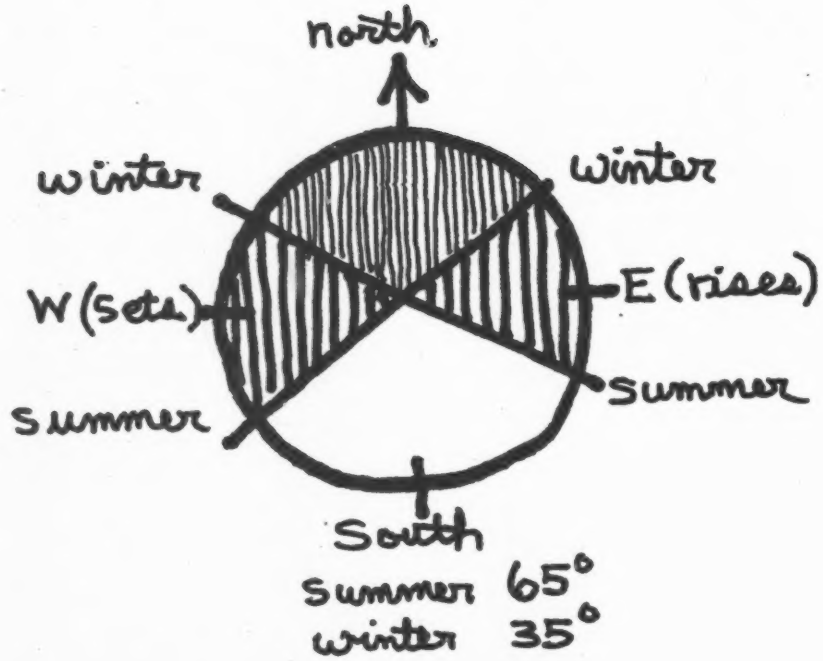
SITE ANALYSIS

A site or multiple sites will be selected as potential development sites. Before any decisions can be made about site selection in regard to development a careful analysis of each available site is essential. A good deal of the information can be obtained by a competent surveyor. John Simonds', Landscape Architecture, lists information that the surveyor can supply.(1, pp 46-47)

1. Title of survey, property location, scale, north point, certification and date.
2. Tract boundary lines, courses, and distances.
3. Building lines, easements, and rights-of-way.
4. Names of abutting parcel owners.
5. Names and locations of existing road rights-of-way on or abutting the tract.
6. Position of buildings and other structures, including foundations, piers, bridges, culverts, wells, cisterns, and the like.
7. Locations of all walls, fences, roads, drives, curbs, gutters, steps, walks, paved areas, and the like, indicating types of materials or surfacing.
8. Locations, types, sizes, and direction of flow of all existing storm and sanitary sewers on or contiguous to the tract, giving top and invert elevations of all manholes and inlet and invert elevations of all other drainage structures. Location, type and

size of all water and gas mains, manholes, valve boxes, meter boxes, hydrants, and other appurtenances. Locations of all utility poles, and telephone lines. For utilities (gas, storm and sanitary sewer, water, telephone, and electricity) not traversing site will indicate, by key plan if necessary, nearest offsite utility leads, giving all pertinent information on ownership, types, sizes, and inverts.

9. Location of swamps or boggy areas, springs, streams, and bodies of water; including spillways, drainage ditches, and the like.
10. Outline of wooded areas. Within areas noted on a sketch will show all trees that have a specific trunk diameter and type of tree.
11. Road elevations. Elevations shall be taken at 50-ft. intervals along center lines of roads and flow line of gutter on property side.
12. Elevations shall be taken and shown on a 50-ft. grid system as well as at the top and bottom of all considerable breaks in grade whether vertical as in walls, or sloping as in banks. Spot elevations shall also be indicated at finished grade of building corners. In addition to elevations required, the map shall show contours at specified intervals. All ground elevations shown should be to nearest tenth of a foot. Permissible tolerance shall be 1.0 ft. for spot elevations and one-half the contour interval for contours.



Sun diagram

Additional information can and should be gathered from direct observation on and around the site. Such additional information might include:

1. Best views, poor views, objectionable views.
2. Which trees of those plotted should be preserved, if possible, and which removed.
3. Flood level from site evidence; undrained or swampy land.
4. Off-site nuisances with their bearing and approximate distances.
5. Logical building areas of the site, logical points of ingress or egress.
6. Sectors where high or low points on the horizon give protection from or add force to the sun and wind.
7. Sun diagram.
8. Prevailing wind breezes.
9. Frost study; low-lying pockets of trapped air.
10. Micro-climate analysis of the area.
11. Other natural features such as springs, an unusual shrub, well knitted ground cover, depth or lack of topsoil, eroded ground, sunken areas-as over mined out coal-and the like.
12. Any other factors of especial importance to the particular project proposed.

In addition to such information observed in the field, supplementary data gleaned from careful research may be plotted directly on the survey or included in the survey file.

Such information might include:

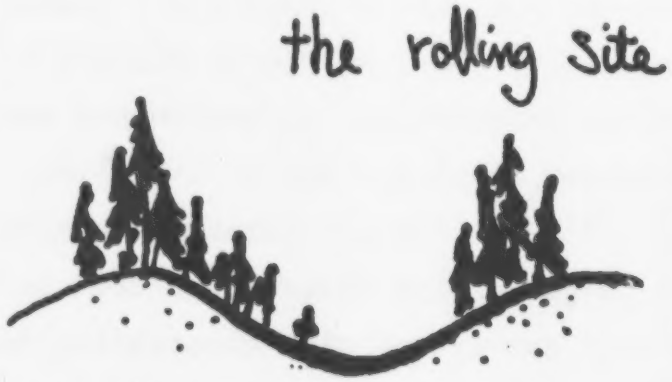
1. Gas and water pressures, normal and guaranteed.
2. Names of utility companies whose lines are shown, company addresses, phone numbers, engineers.
3. Routes and data on projected utility lines.
4. Power capacities.
5. Projected approach roads.
6. Approach patterns of existing roads, drives, and walks.
7. Traffic counts.
8. Easements, rights-of-way.
9. Zoning restrictions, building lines.
10. Mineral rights, depth of coal, mined out areas.
11. Water analysis, if drilled wells are proposed.
12. Core boring data and logs.

John Simonds further states that in developing a sound planning approach, the planner should analyze, through survey information, research, and actual site observation, all site factors and reduce these factors, by symbols, to a site analysis diagram. This analysis can then be logically related to all plan areas and elements.

Graphic survey information is essential, but it must be supplemented with at least one and preferably repeated visits to the site. Only by actual site

observation can we get the "feel" of the property, sense its relationship to the surrounding areas, and become fully aware of the lay of the land. Only in the field can we sense the dynamic lines that are its bounding roads, the insistent lines of pedestrian approach, the arc of the sun, the prevailing breeze, the good views, the ugly views, the sculptural land forms, the springs, the trees, the rock outdrops, the usable areas, the features to be preserved if possible, and the features to be eliminated - in short, the character of the site. We must climb from hollow to hill, kick at the sod, dig into the soil. We must look and listen and fully sense those qualities that are peculiar to this specific landscape area.

Whatever we can see along the lines of approach to the site is an extensional aspect of the site. Whatever we can see (or will see in the probable future) from the site is part of the property. Any topographical feature, natural or man-made, that has any effect on the property or its use is, from the planning point of view, a property feature and must be considered as a planning factor.(1, p. 47)



a program decision...
negation or accentuation

PROGRAM ANALYSIS

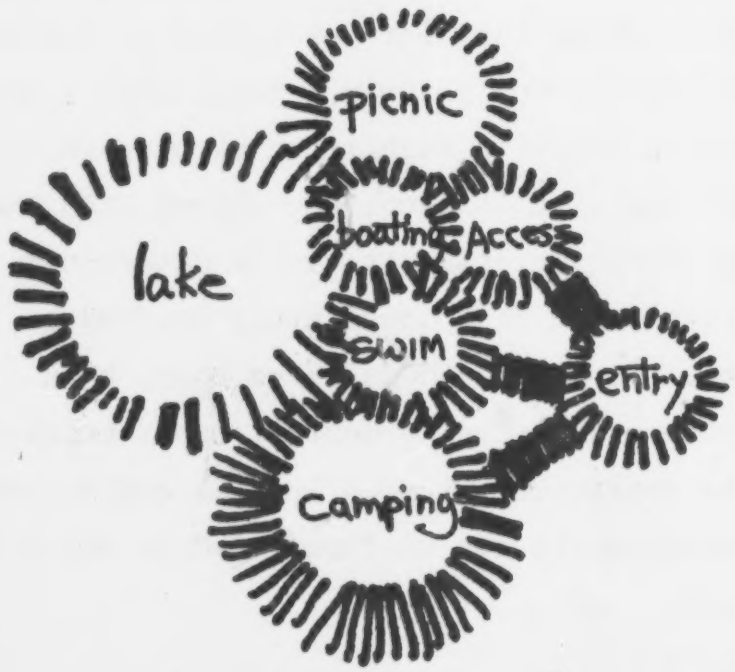
The program analysis is the process of combining the background information as described earlier in this report with the actual site features. From the background information it can be determined which activities are desirable. The general recreation demand, the population characteristics, historical information about recreation, client preferences, all supply basic information about the recreational and educational activities that for one reason or another should be included in the program. Then, with a knowledge of specific activity requirements, such as those listed in part two of this section combined with the specific site characteristics it can be determined which activities could be appropriately handled on the given site. Combining these items then, background information relative to demand, use requirements and site characteristics, a logical and accurate program of requirements can be formulated on which to base the design.

DESIGN APPLICATIONS

"A seed of use - a cell of function - wisely applied to a receptive site, should be allowed to develop naturally, organically, in harmonious adaptation to juxtaposed functions and to its total environment".(1, p. 54) Through careful research and analysis a comprehensive program has been developed. Through controlled survey and site observation the site characteristics become apparent.

Site functions, space requirements, and rough shapes are first analyzed and a schematic use diagram showing the functional and visual relationships, relative space requirements, and idealized placement on the site is prepared. With a sound analysis of all site and plan factors and a clear perception of working relationships, sensitive expression of function and total site can be integrated.

Of great significance here is what has been identified as the "feel of the land". A sympathetic understanding can reveal the inner potentials of a site. It will identify its good features and its bad features. Each site's moods, its limitations, and its possibilities can be identified.

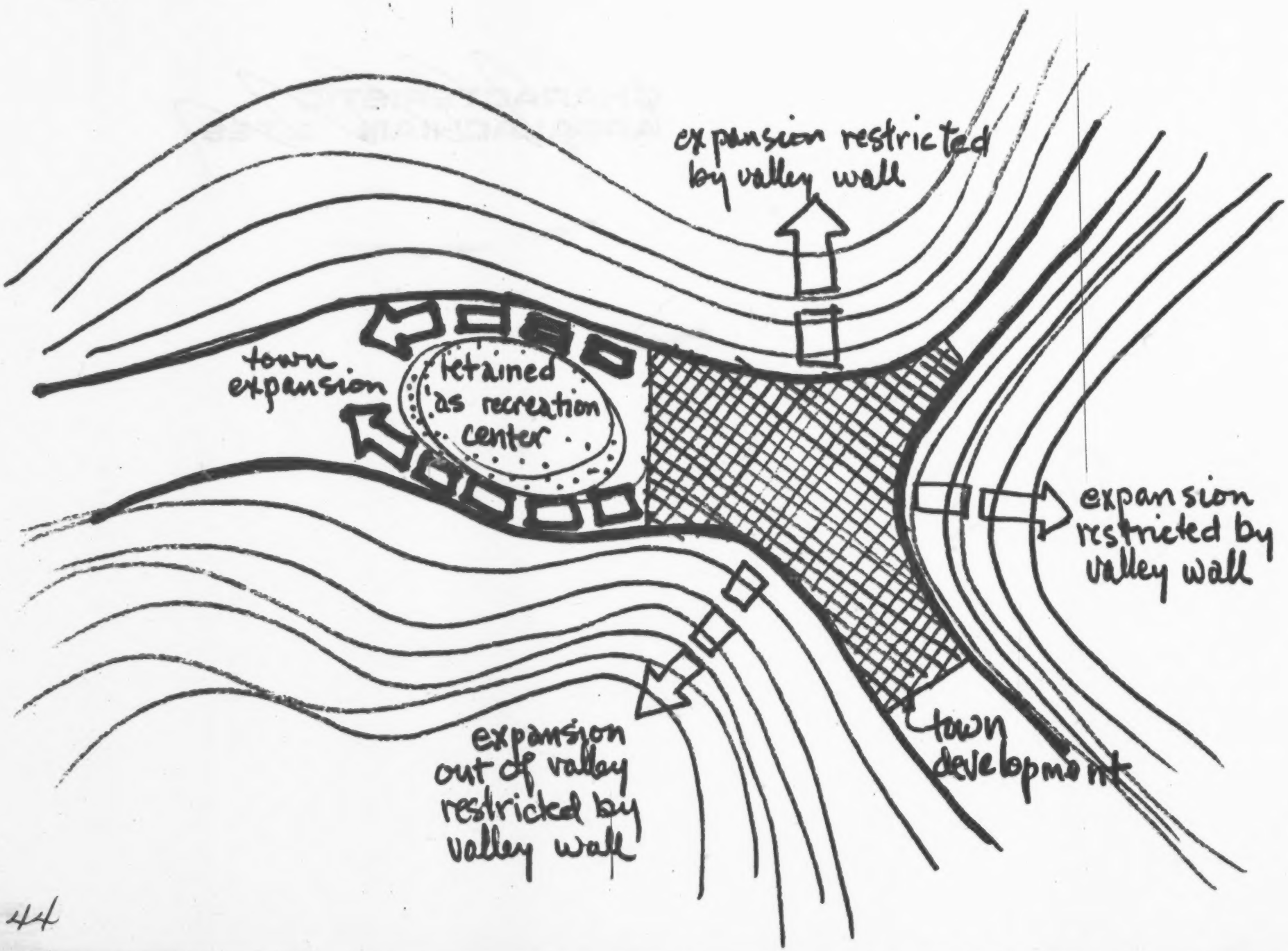


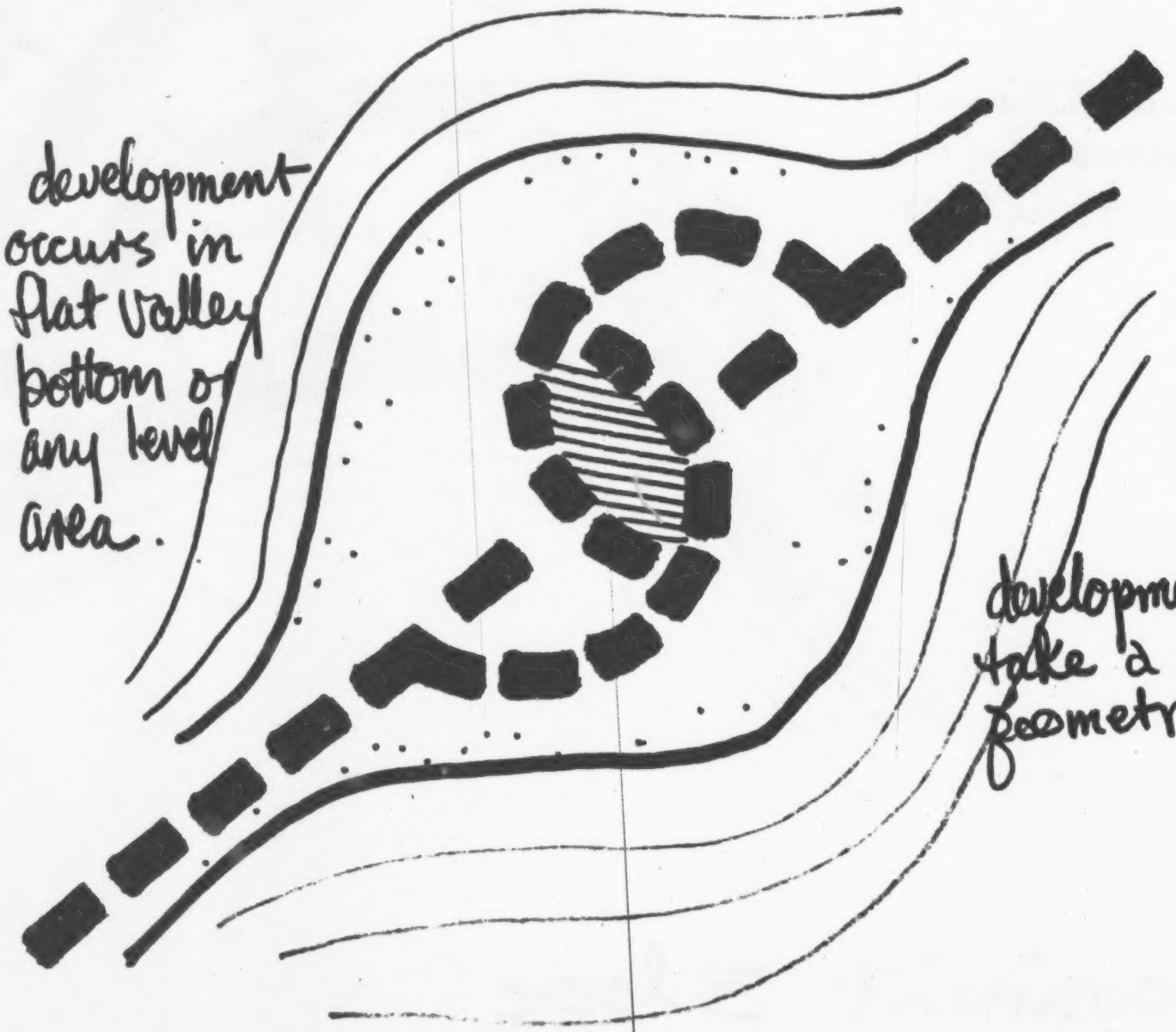
Schematic use diagram

An outdoor recreation development must occur within a natural environment, and more likely than not the natural environment will be more natural and organic than humanized. Clearly there are numerous types of sites and each site will have its own implications and limitations for development. The designer synthesizes the combined factors into a meaningful visual form, which is the dynamic representation of all the forces directed upon the site.

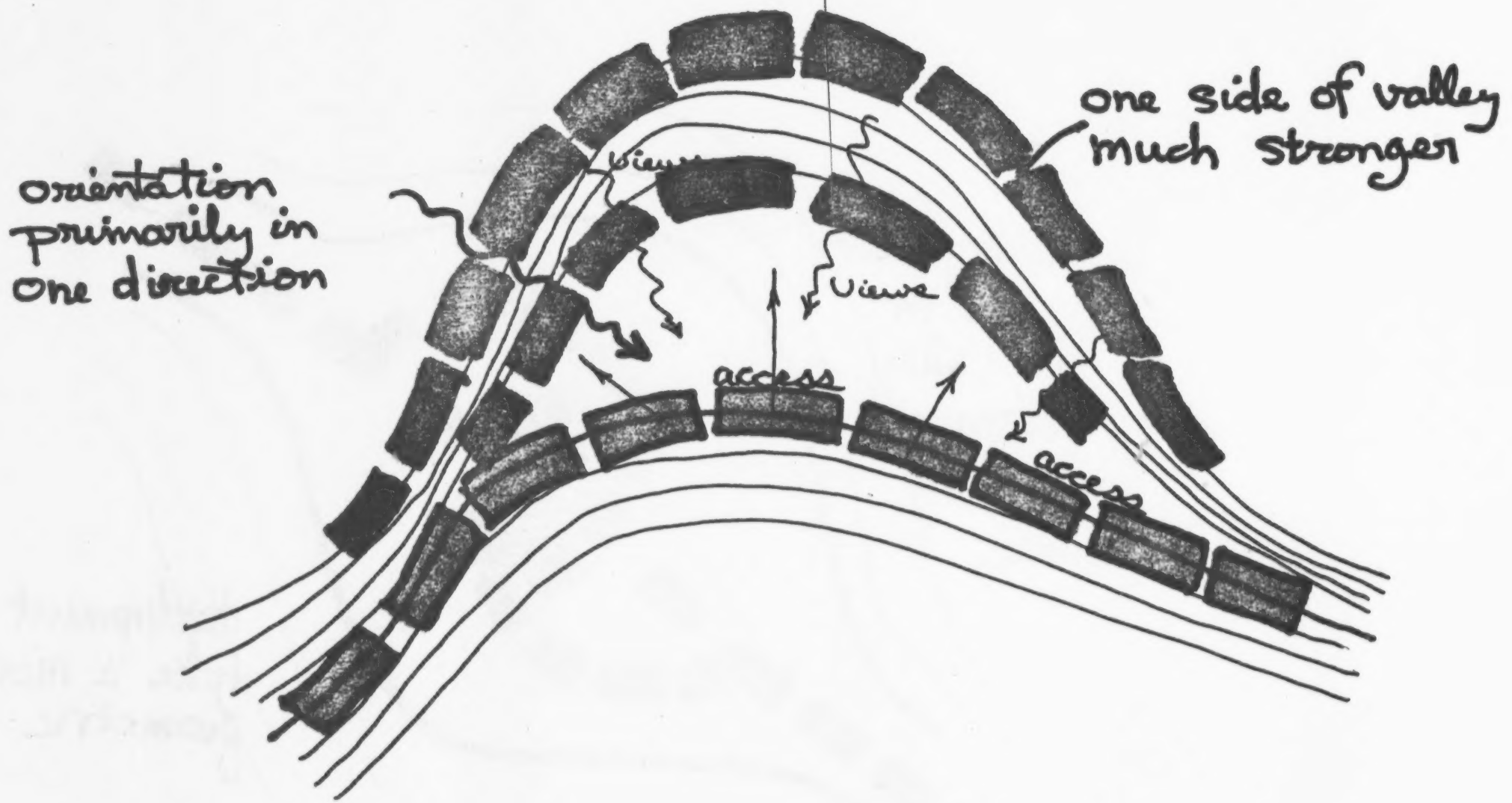
CHARACTERISTIC APPALACHIAN SITES

development relates to town


expansion restricted by valley wall
town expansion
retained as recreation center
expansion restricted by valley wall
expansion out of valley restricted by valley wall
town development

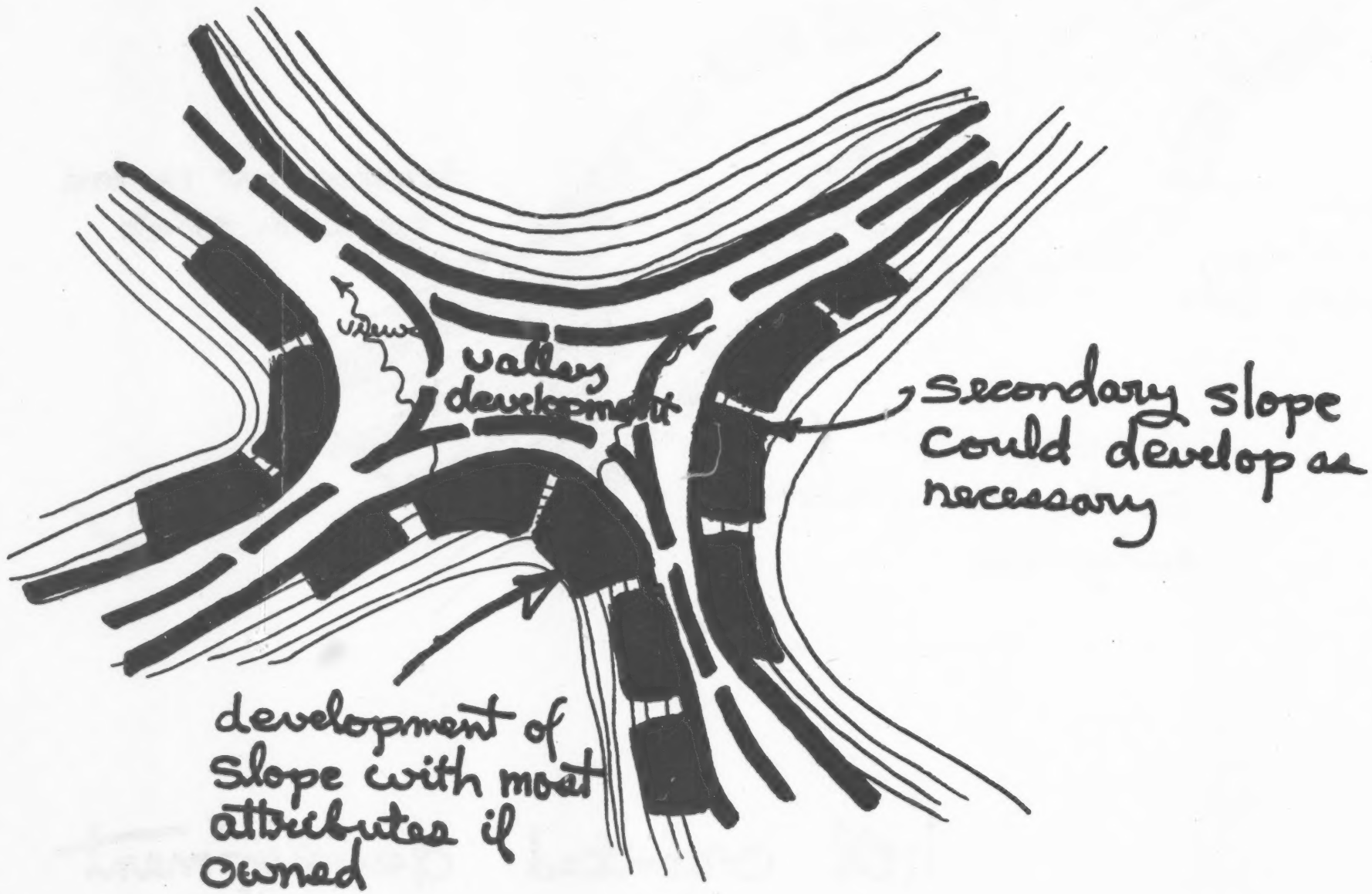


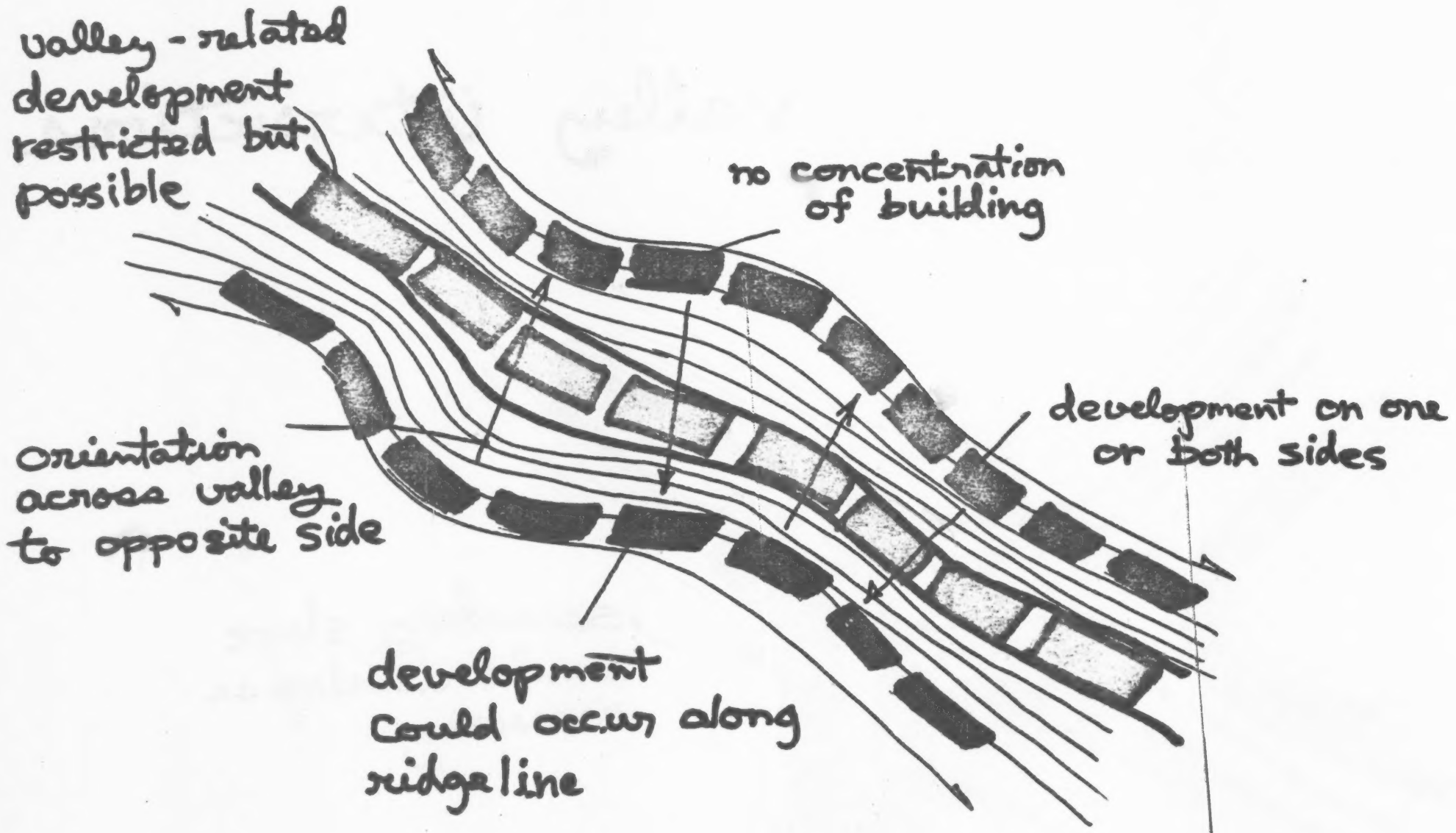
where topography does not dictate form



dominant slope

valley intersections

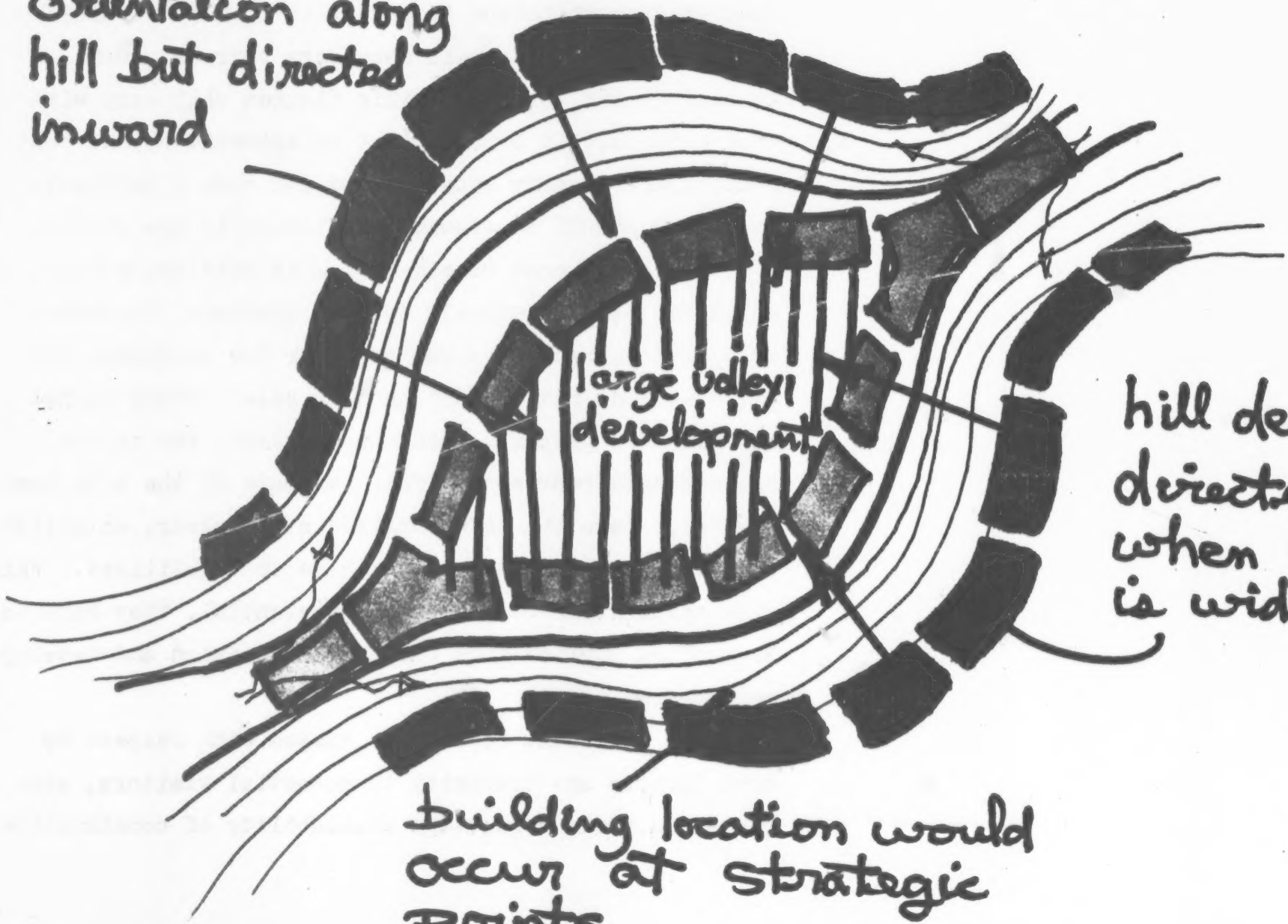



valley - related development restricted but possible
no concentration of building
development on one or both sides
orientation across valley to opposite side
development could occur along ridge line

hill oriented development
narrow valley

inward oriented
broad valley

orientation along hill but directed inward



hill development directed down when valley breadth is wide

building location would occur at strategic points

COST AND IMPACT

COST CONSIDERATIONS

Specific costs for the establishment and operation of a recreation-education facility are described in the Master Plan for the Valley Campus Complex at Delhi. However, for prototype purposes, it is only possible to consider those factors necessary to reach such determinations, since specific figures will vary with such factors. It is important to appreciate that cost factors are closely interrelated and that a particular cost item should be viewed in relation to the others.

A primary cost consideration is site acquisition which can be a relatively complex problem. Transferable state-owned sites may engender few problems, but private lands may present another case. Where market activity for proposed sites is existent, the market price should represent a fair estimate of the site cost. However, where the market price is not clear, established cost-measuring procedures may have to be utilized. While site acquisition costs may be substantial, they have to be weighed against such factors as location and development costs.

The locations have to be viewed with respect to such factors as: proximity to potential visitors, students and their needs; the availability of construction

facilities, materials and utilities; and the existence of sufficient recreational resource site potential. Often the latter factor is not commensurate with the first two factors. An unspoiled site offering sufficient environmental diversity, views, overlooks, unique geographic features, and adequate unpolluted water resources may only exist because of its remoteness from potential users, construction facilities, and utilities. These elements are typically found in more accessible areas where development is easier, but has resulted in urban sprawl that has desecrated and polluted the immediate environs. In addition, the development costs are likely to be higher in areas possessing a high recreational resource potential. Accessibility, water supply, and sewage disposal may be expensive problems on sites possessing desirable aesthetic attributes as mountains, gorges, ravines, and rock outcroppings.

In addition to locational factors, development costs are affected by such factors as the scale and quality of the facility. Scale is used here to encompass the considerations of size, intensity and diversity. Size is related to the established need and impact. Obviously the greater the capacity the greater the cost. Concentrated development may result in reduced cost,

but must be weighted against possible reduction in quality of some of the recreational components. Some aspects of outdoor recreation are directly related to such characteristics as spaciousness, privacy, and communication with nature. While relatively high intensity is acceptable for some activities, others are valued for the respite they provide from highly intensive conditions. The diversity of particular facilities is related again to need and in turn would usually directly relate to costs. However, a variety of facilities would provide wide appeal for visitors and a more comprehensive education for students. Scale considerations are also a function of site limitations and constraints.

The relationship of scale to quality implied in the above discussion refers to the quality of the recreational experience and educational process. As a separate factor, the term quality is also used to refer to characteristics of materials, the performance of labor, and the design of the facility. A plan derived from the careful thought of qualified professionals would almost certainly avoid many costly pitfalls. A major contribution of a designer would be to work with the important psychological behavioral, and sociological

aspects of relating man to the environment. However, the designer is also concerned with efficient workability of the physical facility. In this regard, he specifies materials and methods of construction that will result in a safe, efficient, and durable end-product that will require a minimum of maintenance.

Maintenance and operational costs are related to almost all of the previously discussed factors. The more remote the site, the more diverse the terrain; the larger the complex, the more extensive the development; the more diverse the facilities, then most assuredly the greater the maintenance and operational costs. Perhaps of special note is the problem of securing those qualified maintenance and operational personnel who need special training, such as faculty, to work in remote locations. However, the greater the quality of materials, labor, and design, the less maintenance and operational costs should be. It is unfortunate that the high initial cost for quality often results in the construction of a low quality facility. Inevitably this action results in continuing and often increasing maintenance and operating costs.

In a specific situation the above cost factors may be utilized in the decision making process to resolve curriculum, recreational, and site considerations to a point where a program may be developed into a master plan. At this time it is possible to perform standard cost-estimate procedures. Unit-prices may be obtained for the specific locale and that point in time and applied to the master plan to determine developmental costs. Staffing and material estimates for maintenance and operational costs have to be considered with reference to projected costs through time.

A final cost should be mentioned even though it does not accrue to the facility directly, but to proximate communities. It is the cost of supplying the additional demands for such public facilities as roads, water supply, sewerage, and policing. However, to offset these costs is the economic impact of the facility, enriching the tax base, augmenting the revenues, and generally stimulating economic activity.

EDUCATIONAL IMPACT

The proposed combined recreation-education complex would serve directly to expand the experience opportunities for vocational and other students on the academic campus. It would also provide learning opportunities for the community at large and create an awareness of needs and implications of conservation, and proficiency in land and water recreation activities. In particular, the proposed facility would provide learning experiences for local schools through field trips and related coordinated educational programs.

The graduates of the proposed program would help meet the need for competent supervisors and managers of recreation and resort facilities both in the immediate area and throughout the Appalachian Region. Besides meeting the overt need for such personnel in federal, state and other government and public agencies, the impact would be felt in the private sector. The facility would stimulate and educate prospective private enterpreneurs by developing qualified personnel to serve in private enterprises. In addition, the facility would produce specialists in recreation and conservation who may in turn, pass on their knowledge through the public school system. Secondary effects would result as more

people are trained in outdoor education, the use of facilities, conservation, etc., along with increased participation in outdoor activities. Such benefits can be expected to accrue for example, by way of general improvements in physical and mental health, which in turn could lead to a reduction in demand for health services.

In this section, the nature and scope of the educational impact of a recreation-educational facility has been presented as a brief review of what has been discussed in detail in Volume I. This overview has been incorporated herein, in order to present all the pertinent considerations together, within this volume. For further coverage, substantiation and other references refer to Volume I of this report.

ECONOMIC IMPACT

As with the previous section, a broad overview is provided here which summarizes the discussion in Volume I. The basic pertinent points are reiterated to present a comprehensive coverage of considerations relevant to the prototype development.

The economic impact of a recreation-education facility ranges from the immediate direct impact of the facility itself on the local community, all the way to the indirect impact of the graduates, over the whole Appalachian Region causing, in turn, further impact on the nation as a whole.

The immediate economic impact of the facility may be divided into the impact of the recreation facilities alone, and the impact of the establishment and operation of the educational facility. The economic significance of both, develop from their characteristics as an "export" industry, exchanging local services for income originating outside. For the recreation facility, the local impact is dependent on the nature of recreational resources, the number of visitors attracted and the extent of their expenditures which are retainable in the local economy. Similarly, for the educational facility, the local impact may be described as being dependent on the nature and scale of its operations, the number of faculty and students

it attracts and the extent to which expenditures for goods and services are retained in the area.

The recreation-education facility has the potential for creating an amenity that would attract and augment the establishment of other than recreation oriented industries. For example, industry might be attracted into the area by the existence of the amenities offered for both recreation and education of its employees and their families.

Another facet of economic impact would be realized through the work of the graduates of the facility. The wise development and management of recreation resources would be possible with the knowledge and understanding gained by such graduates. As individuals and as associates they would implement procedures and programs that would utilize recreation potentials to their fullest capacity. Not only would economic impact as described for the recreation component result, but by example others in the community would benefit. Direct information dissemination would also be available from those graduates employed in advisory agencies. Thus, many might be stimulated to augment their incomes through the activities of such graduates. By introducing outside

money to obtain the resulting recreational services, additional economic activity would accrue to the local supplier of related goods and activities. The resulting multiplier effect of such developments could produce a significant total economic impact.

The educational facility, considered by itself, necessitates the maintenance of both faculty, staff, and students. This involves the construction and maintenance of appropriate housing and the development of associated services that would provide such items as: food, water, utilities, recreation, amusements, and cultural activities. These needs provide local businesses opportunities for expansion and growth which in turn, effects the employment situation. Consequent reduction of employment should also reduce the deployment of welfare and other social assistance services. All of these factors would tend to improve the local tax base.

The recreation component of the facility by attracting visitors that would also purchase goods and services, would thus contribute to the local economy. The maintenance of the operation would also mean employment for local, relatively unskilled, personnel. Visitors,

especially overnight visitors, would also require, or might desire, a multitude of recreational goods and services, stimulating local business activity. Motels, restaurants, sporting stores, bait shops and souvenir shops are among those to benefit most immediately.

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